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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/624,254	07/22/2003	George E. Kim	UC1.PAU.22	7355

23386 7590 09/06/2007
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EXAMINER

AUSTIN, AARON

ART UNIT	PAPER NUMBER
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1775

MAIL DATE	DELIVERY MODE
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09/06/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/624,254	Applicant(s) KIM ET AL.	
	Examiner Aaron S. Austin	Art Unit 1775	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 June 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 11-13, 25, 27, 28, 30 and 37 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 28 and 30 is/are allowed.
- 6) ☒ Claim(s) 1, 11-13, 25, 27 and 37 is/are rejected.
- 7) ☒ Claim(s) 13 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

Claim 13 is objected to because of the following informalities: lines 3-4 recite "a cryomilled nanocrystalline an MCrAlY" rather than " a cryomilled nanocrystalline MCrAlY". Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1, 11, and 12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1, 13, 25, and 37 utilize the phrase "consisting substantially of" or a variation thereof. The use of this term is not in accordance with current US practice and as such the scope of the claim is indefinite. More particularly, while "consisting of" has a clearly defined meaning in common practice, the inclusion of the term "substantially" opens the interpretation of the claim to include elements being the understood meaning of "consisting of". It is suggested that applicant amend by using terms whose scope is understood, namely, "consisting of" or "consisting essentially of" to overcome these rejections.

Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission

Art Unit: 1775

amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are: the relationship between the "substrate" of line 3 and the "metallic substrate" of line 7. For purposes of examination, they are treated as the same substrate.

Claim 11 recites the limitation "the MCrAlY" in line 5. There is insufficient antecedent basis for this limitation in the claim.

Claim 11 recites the limitation "the nanocrystalline bond coat" in line 9. There is insufficient antecedent basis for this limitation in the claim.

Claim 12 recites the limitation "alumina" in line 7. There is insufficient antecedent basis for this limitation in the claim.

Claim 12 recites the limitation " the nanocrystalline bond coat " in line 7. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claim 1, 13, and 37 are rejected under 35 U.S.C. 102(b) as being anticipated by Lavernia (US 5,939,146).

Lavernia teaches a method for improving a thermal barrier coating and coating produced thereby comprising cryomilling (column 5, lines 30-32) a CoCrAlY (column 6, line 21) to nanocrystalline grain sizes and thermally spraying the product on a substrate to form a bond layer (column 6, lines 20-26). A ceramic outer layer is deposited on the bond layer (column 6, lines 20-21).

Regarding claim 13, HVOF and other forms of thermal spraying may be utilized (column 6, line 65 to column 7, line 8).

Claims 1, 13, and 37 are rejected under 35 U.S.C. 102(e) as being anticipated by Hebsur (US 6,805,725).

Hebsur teaches a bond coat comprising NiAl and CoCrAlY which is cryomilled in nitrogen, and plasma sprayed onto a substrate. A ceramic top coat is formed over the bond coat. During cryomilling, AlN particles are formed in the bond coat and have a particle size of 10-50 nanometers. This is considered nanostructured. The bond coat is formed via a method that is commensurate with that of the instant specification; therefore the article is expected to share similar characteristics.

As noted above, the transitional phrase "consisting substantially of" does not limit the scope of the claim in the same manner as the term "consisting of" would. More particularly, the use of "substantially" indicates other materials may be present. Thus Hebsur teaches a product within the limitations of the claim language.

Regarding claim 37, the MCrAlY layer will be crystallized as like materials are used in a like manner to the claimed invention. Please note, the recitation of

“nanocrystalline” is interpreted as meaning a crystalline form measurable on a nanoscale as no size limitation is provided by the claims.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hebsur (US 6,805,725) in view of Hebsur et al. (US 5,635,654).

Hebsur '725 teaches a bond coating formed via cryomilling as discussed above, but does not teach formation of aluminum oxide during cryomilling.

Hebsur '654 teaches a bond coating similar to that of Hebsur '725, and further teaches that depending on the material system being used, cryomilling can be reacted with nitrogen or oxygen. As discussed in both patents, nitrogen forms AlN particles in the bond coating, and Hebsur '654 teaches that oxygen forms alumina on the powder particles. As Hebsur '654 teaches that NiAl may be cryomilled with oxygen or nitrogen depending upon the material system being used, it would have been obvious to one of ordinary skill in the art at the time of the invention that the bond coating of Hebsur '725 could also be cryomilled with oxygen. Furthermore, Hebsur teaches that the net result of milling NiAl in liquid nitrogen is an arrangement of fine particles of AlN, NiAl, and alumina on the NiAl powder surface (col. 2, lines 15-22). With this teaching it is

expected that the bond coat of Hebsur '725 would already possess alumina particles in addition to the AlN particles.

Allowable Subject Matter

Claims 28 and 30 are allowed.

As allowable subject matter has been indicated, applicant's reply must either comply with all formal requirements or specifically traverse each requirement not complied with. See 37 CFR 1.111(b) and MPEP § 707.07(a).

The following is a statement of reasons for the indication of allowable subject matter: the prior art fails to show a combination of method steps wherein an MCrAlY layer is coated with a MCrAlY nanocrystalline nano-composite coating formed from refining the microstructure of an MCrAlY to nanocrystalline grain size wherein the step of refining includes cryomilling in the presence of alumina particles added during the cryomilling step.

Response to Arguments

Applicant's arguments, see the Remarks, filed 6/5/07, with respect to the previous rejections under 35 USC 112 have been fully considered and are persuasive in light of the present amendments. These rejections have been withdrawn.

With respect to claims 11, 12, 28, and 30, applicant incorrectly states the negative limitations rejected under 35 USC 112 of the prior office action were not

Art Unit: 1775

directly a part of the substance of the claims. On the contrary, these claims depended directly on the claims that included the negative limitations and as such included the negative limitations themselves.

Further, applicant states claims 11, 12, 28, and 30 were found distinguished by the Examiner over the prior art references. While this is true with respect to the claims including the negative limitation "without inclusion of other metallic alloys", it is not true with respect the newly amended claims wherein the negative limitation has been removed. Thus the rejections as set forth above remain.

Applicant's arguments with respect to the Hebsur reference have been considered but are moot in view of the new ground(s) of rejection. In particular, applicant argues the interpretation of "conditions" in Hebsur '725 at col. 3, line 30 does not allow for an interpretation where no other materials are present. However, the requirement that no other materials are present has been deleted from the claims. Therefore the argument is moot.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

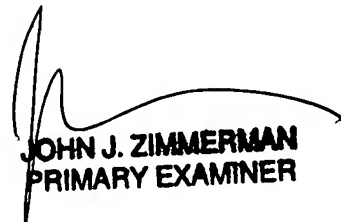
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Aaron S. Austin whose telephone number is (571) 272-8935. The examiner can normally be reached on Monday-Friday: 7:30 AM to 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jennifer McNeil can be reached on (571) 272-1540. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1775

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

ASA



JOHN J. ZIMMERMAN
PRIMARY EXAMINER